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EPA-REGION 10

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VIA E-MAIL AND U.S. MAIL

U.S. Environmental Protection Agency
Attn: Harbor Comments
805 SW Broadway, Suite 500
Portland, OR 97205

Re: Comments of Schnitzer Steel Industries, Inc. and MMGL Corp. on the Proposed Plan for the Portland Harbor Superfund Site

I. INTRODUCTION

On behalf of Schnitzer Steel Industries, Inc. (SSI) and MMGL Corp., formerly known as Schnitzer Investment Corp. (MMGL), we write to comment on the U.S. Environmental Protection Agency's (EPA's) June 2016 Superfund Proposed Plan (Proposed Plan) for the cleanup of the in-river portion of the Portland Harbor Superfund Site (Site). As discussed below, the Proposed Plan is seriously flawed, and certain changes are needed to ensure that the Site remedy can be implemented and maintained successfully while minimizing unnecessary disruptions to the community.

The Proposed Plan is intended to supplement the Remedial Investigation and Feasibility Study (RI/FS) and to provide the public an opportunity to comment on EPA's preferred remedial alternative and other alternatives evaluated in the remedy selection process. See 40 Code of Federal Regulation (C.F.R.), Section 300.430(f)(2). EPA has released its Proposed Plan for the Site sixteen years after work commenced on the Portland Harbor RI/FS. At crucial junctures, SSI and MMGL have shared with EPA significant concerns regarding the RI/FS process and have proposed specific changes. These concerns and proposals are summarized in submissions including their March 5, 2008 comments on the Round 2 Site Characterization Summary; their May 12, 2010 comments on the Draft Remedial Investigation (RI) Report; and their December 7, 2012 comments on the LWG's Draft Feasibility Study Report. SSI and MMGL were also among the parties that submitted to EPA the October 2011 white paper entitled Portland Harbor: Policy Intervention Needed. In addition, SSI was among the parties that commissioned and submitted to EPA in 2012 three reports prepared by The Brattle Group: Economic Impacts of Remediating the Portland Harbor Superfund Site, January 3, 2012; Impacts of Portland Harbor Remediation Costs on the City of Portland Water and Sewer Rates, March 27, 2012; and Fish Consumption in Portland Harbor, October 23, 2012. In October 2015, SSI also joined with other parties in submitting comments to EPA for distribution to the National Remedy Review Board concerning EPA's Revised Draft FS for the Site. EPA has made presentations to SSI and MMGL together with other parties on a few

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occasions but has not resolved most of the issues raised in our prior comments. Accordingly, many of those prior comments still apply to the current remedy selection process.

In key respects, however, EPA's Proposed Plan departs from much of the RI/FS work that preceded it. In the last few years, EPA took over finalization of the RI/FS from the LWG, discarding a substantial portion of the results of the work it required the LWG to perform. As a result, EPA's Proposed Plan and June 2016 FS raise new, additional concerns beyond those raised in prior comments. Our comments on the Proposed Plan and remedial alternatives identified in EPA's June 2016 Feasibility Study (FS) focus on four primary issues that should be addressed:

- The Proposed Plan and remedial alternative assessment in the FS should be revised to identify the significant information gaps that must be filled before the remedy can be finalized. For example, despite the substantial work over a sixteen-year period, EPA acknowledges that the Site needs to be sampled again in a re-baselining effort since much of the original data is now very old and not representative of current Site conditions. EPA has also concluded that it does not yet have sufficient information to calculate the rate of natural recovery. More recent data has shown that sediment quality is improving, and will continue to improve, through the process of natural recovery and that more extensive use of monitored natural recovery than currently contemplated by EPA is appropriate. Such information regarding current conditions and future trends is necessary for finalizing the remedy and should be obtained and incorporated prior to issuance of the final Record of Decision (ROD). In the event EPA intends to proceed with the final ROD before this information is incorporated, the Proposed Plan should also be revised to ensure that the ROD is sufficiently flexible to allow necessary revisions to the Site's preliminary remediation goals (PRGs), Remedial Action Levels (RALs), technology assignments and assessment of technical practicability once this information is incorporated.
- The Proposed Plan and remedial alternative assessments in the FS should be revised to remove cleanup goals for media outside the scope of this remedy selection process since those requirements are unsupported by information developed in the RI/FS, conflict with the State of Oregon's source control efforts and threaten to upend the State's numerous agreements with cooperating owners and operators.
- The Proposed Plan and remedial alternative assessments in the FS should be revised to correct improper application of the Principal Threat Wastes (PTW) approach. As discussed below, the PTW approach as applied in the Proposed Plan is unwarranted, unsupported, contrary to EPA guidance and inconsistent with EPA's approach at other sediment Superfund sites.
- The Proposed Plan and remedial alternative assessments in the FS should be revised to incorporate and present more accurate and complete information regarding the significant community impacts that will result from each of the alternatives. As discussed below, the Proposed Plan and FS significantly underestimate future costs and the time required to complete each alternative and fail to describe accurately the other burdens to be borne by the community such as increased truck traffic, traffic interruptions, impaired use of properties, and noise and light disturbances. This additional information is necessary for EPA to assess the relative costs and benefits of the remedial alternatives and for the public to consider and knowledgeably comment on the Proposed Plan.

In addition to the foregoing technical comments, SSI and MMGL also request that the Proposed Plan be revised to identify additional procedures that can be implemented to increase prospects for a successful remedy. During the sixteen-year RI/FS process leading up to the Proposed Plan, EPA required the LWG to compile substantial data and to perform extensive analysis, much of which was never used in the FS or Proposed Plan. As documented in multiple dispute resolutions between EPA and the LWG, the RI/FS process was fraught with disagreements over procedural and substantive issues, and EPA was criticized for requiring substantial work of questionable value, causing needless delay and complexity, reversing its position on key issues, and rendering decisions without sufficient transparency regarding the underlying support and methodology. Given the complexity of the Site and the significant unresolved issues, SSI and MMGL urge EPA to consider measures to ensure greater efficiency and to reduce duplication and waste moving forward. EPA should revise the Proposed Plan to describe these measures and, to the full extent possible, incorporate them into the ROD to increase prospects for a successful remedy.

These deficiencies in the Proposed Plan and FS are significant. Various revisions and additional information and analysis will therefore be required to ensure that the Site remedy can be achieved.

II. THE PROPOSED PLAN MUST ACKNOWLEDGE AND ACCOUNT FOR CURRENT INFORMATION GAPS AND ERRORS

In the Proposed Plan, EPA acknowledges that additional information must be obtained before work can commence on the remedial designs for the Site. This missing information includes new sediment data that reflects current Site conditions and background concentrations and information that can support an analysis of the rate at which the Site is recovering through natural processes.

This data is critical both for identifying current conditions and for assessing the relative strengths of the remedial alternatives. Since that information has not yet been incorporated, the Proposed Plan instead relies on certain very pessimistic assumptions that have resulted in an overly-conservative approach designed for a theoretical site that does not exist. As a result, the Proposed Plan describes a remedy for the Site that likely cannot be achieved in a reasonable timeframe or maintained despite diligent source control efforts.

When the additional information is obtained, the assumptions underlying much of the Proposed Plan should yield to the actual data. At that time, it will be necessary to re-assess key portions of the analysis underlying the Proposed Plan as discussed below. Given this need for additional data and analysis, EPA's current remedial approach for the Site is far too prescriptive and inflexible. As discussed below, the Proposed Plan should be revised to identify with greater specificity the additional information required as well as the nature of, and rationales for, the assumptions that EPA has made in the absence of such information. This information and analysis should be incorporated prior to issuance of a final Record of Decision (ROD). If EPA nonetheless decides to proceed with the ROD before this information is available, the Proposed Plan should also be revised to ensure that the ROD is sufficiently flexible to allow this additional information to be incorporated into the remedy, with revised PRGs, RALs, technology assignments and assessment of technical practicability as discussed below.

A. Re-Baselining Is Required for Remedy Selection

In the Proposed Plan, EPA acknowledges that additional information is needed to establish a baseline of current Site conditions. *See, e.g.,* Proposed Plan, p. 26 ("[t]hese assumptions were developed based on existing data and will be finalized during the remedial design, after design

level data to refine baseline conditions are obtained.”) However, the Proposed Plan does not expressly acknowledge the nature of the additional data required. At complex Superfund sites, it is sometimes necessary to collect supplemental data after the remedy has been selected to fill in the details as needed to support remedial design work. While post-ROD, “design level” data-gathering is not unusual, much more expansive sampling is needed here since it is intended for a different purpose – to re-sample locations throughout the Site to obtain new data to replace older data (some more than a decade old) that no longer reflect current Site conditions, as discussed in Part II.C below.

This missing data is not needed solely for the remedial design stage; it is also needed now for the remedy selection process. For example, the RALs described in the Proposed Plan are based on surface sediment data as EPA acknowledged in the FS. *See* FS, Section 3.4.1.2 (“[t]he selected RALs are a function of the distribution of surface sediment data at the Site...”.) When new sediment data is obtained, the analysis for distribution of surface sediment data will need to change, which almost certainly will result in revised RAL curves for each contaminant of concern (COC) identified at the Site (*see, e.g.,* FS, Figures 3.4-1 through 3.4-6). The revised curves would require alterations to the current RALs identified in the Proposed Plan.

The changes required by the re-baselining data will then ripple through various calculations and analyses throughout the Proposed Plan. For example, the areas of the Site requiring active remediation will need to be refined since they are based on the RALs. Changes will also be required for the PRGs and the estimates for project costs and durations used in the comparison of remedial alternatives as discussed in greater detail in subsequent sections.

Section Conclusions:

- The Proposed Plan should be revised to identify with more specificity the nature and anticipated scope of additional data collection efforts needed for re-baselining.
- The Proposed Plan should acknowledge that certain calculations, analyses and conclusions described in the Proposed Plan and FS will need to be changed once the additional data is incorporated and should identify those items with specificity.
- Among the aspects of the Proposed Plan and FS that will need to be altered once additional data are obtained are the RALs, the PRGs, the areas of anticipated active remediation, and the estimates of project costs and durations used in the remedial alternatives, all of which are dependent, directly or indirectly, on baseline sediment data.

B. The Calculation of Background Concentrations Should Be Revised

The re-baselining effort should also include sampling to obtain an updated and more robust background dataset that can support a more accurate determination of background concentrations. The accuracy of the background calculation is particularly significant at Portland Harbor since EPA directives during the RI/FS process skewed the risk assessments so badly as to render the risk-based cleanup goals unusable for many key substances as they would require cleanup to levels below anthropogenic background. As a result, the background calculation becomes the *de facto* target for cleanup goals for a number of chemicals of concern including PCBs. In fact, EPA’s determination on the background for PCBs which EPA set at 9 parts per billion (ppb) is driving more than 90% of the risk at the Site.

Given the significance of the background calculation in the remedy selection process, the background dataset that EPA used for the FS and Proposed Plan is astoundingly limited. For example, the background calculation for PCBs was based on a mere 18 offsite samples cherry-picked by EPA. Moreover, this existing dataset is of questionable reliability or value as a result of EPA's decisions to remove data EPA identified as "outliers." As documented in materials submitted to EPA in connection with multiple dispute resolutions with the LWG and prior comments submitted by SSI, MMGL and numerous other parties, these determinations by EPA were not based on any legitimate statistical methodology. Additionally, in a dynamic system like the Willamette River, background values would be expected to vary over time. A more robust assessment of background using updated data should therefore be incorporated into the remedy selection process. This additional assessment should address the serious problems in EPA's current approach as discussed below.

First, EPA made numerous unsupported decisions to ignore data collected in the RI/FS process, dramatically lowering the calculation of background for PCBs to just 9 ppb. This level is even lower than the quantification limit for older sediment data collected at the Site, meaning that it is even below the level at which PCBs could be detected when many of the sediment samples were collected. A cleanup level of 9 ppb for PCBs is impractically low and is not attainable in an urban system. Even after the remedy is constructed under any of the remedial alternatives evaluated in the FS, sediments would continue to enter the Site from upstream with PCB concentrations greater than 9 ppb, and the Site will not be able to reach equilibrium. As noted in the LWG's submissions to EPA in August 2014, the estimated equilibrium concentration of PCBs based on existing RI empirical data is approximately 20 ppb. As the LWG noted at that time, it is not appropriate for EPA to select risk-based PRGs for substances such as PCBs that are below equilibrium values. Neither the Proposed Plan nor FS address those findings nor do they present any evaluation of equilibrium.

To rectify this issue, EPA needs to re-evaluate background with a newer, more complete background dataset prior to finalizing the remedy selection process to address issues including the following:

- The background calculation must take into account data from the "Downtown Reach" of the Willamette River that runs through Downtown Portland immediately upstream of the Site. In selecting the background dataset, EPA limited the data to samples collected between River Miles 15.3 and 28.4, excluding all sediment data directly upriver of the Site. In support of this decision, EPA noted that the Downtown Reach includes discrete inputs from several historical industrial sites, as well as general inputs associated with urbanization. This fact, however, does not justify a decision to exclude *all* such data from the background calculation. Rather, upstream data could have, and should have, been evaluated to distinguish those results appropriate for inclusion in the background dataset from those that should be excluded. Had EPA allowed this additional data to be included, the additional data would have yielded a "background" concentration of 30 to 35 ppb, a level much more appropriate for an urban system.
- Even for samples collected further upstream, EPA censored the data. For PCBs, EPA, without sufficient explanation or justification, required the LWG to remove various results as purported "outliers," some apparently based solely on EPA's subjective decision that the certain levels did not conform to its assumption that such data must follow a normal distribution. Because the data was not normally distributed, EPA admits that "greater emphasis was given to the visual examination of the data to

supplant the results of the statistical tests alone." EPA therefore removed data points merely because "they appeared sufficiently distinct from the remaining dominant population to warrant their exclusion from the background calculation." EPA cannot exclude data without a sound technical basis just because some results look "distinct." In fact, there is no valid scientific basis for concluding that all background data must be normally distributed, nor is there any legitimate reason to exclude results from a dataset on that basis. EPA's approach of removing data from a dataset simply because the results, in EPA's subjective view, look too high is scientifically indefensible and contrary to applicable EPA guidance.

- EPA also inappropriately aggregated older data collected over the course of more than a decade in different types of sediment without any regard to the potentially significant variations due to changes in conditions over time, seasonal changes and the impact of sediment characteristics such as grain size. The data that EPA allowed in the background dataset are from investigations as far back as 1999. None of the data is more recent than 2007. In addition, the background concentrations for some key contaminants are even lower than the detection limits for a substantial portion of the data collected at the Site. For example, approximately one quarter of the calculated dry weight background values for total PCBs are less than 30 ppb. Detection limits for total PCBs in data collected prior to sampling for the Portland Harbor RI were generally around 30 to 35 ppb. Therefore, the current PCB "background" level of 9 ppb is much less than the detection limits of older PCB data used in the Portland Harbor dataset. New data must be collected before finalizing the background level calculated for PCBs and applied as the PRG.

Section Conclusions:

- The Proposed Plan should be revised to include a more robust and up-to-date background dataset and more complete and accurate background calculation.
- Sediment data from the Downtown Reach should be evaluated for inclusion in a new background dataset since there is no basis for excluding all such data.
- In evaluating sediment data for potential inclusion in the updated background dataset, EPA must follow a scientifically-accepted methodology, which it should expressly describe for purposes of the background calculation; EPA cannot exclude data merely because it does not fit a normal distribution or because it may look "distinct."
- In compiling and selecting the updated background dataset, factors to be considered should include seasonal fluctuations in concentrations and the characteristics of the sediment being sampled including grain-size.

C. A More Complete Analysis Regarding the Rate of Natural Recovery Is Needed For Remedy Selection

Contaminant levels at riverine Sediment sites can change markedly over time due to a variety of factors. Over the past few decades, Oregon Department of Environmental Quality ("DEQ") has overseen efforts by numerous owners and operators along the Willamette River to control potential sources to the Site. These and other efforts have allowed the Site sediments to begin recovering through natural processes. For some impacts, it is preferable to facilitate conditions for monitored natural recovery (MNR) rather than engage in more invasive efforts such as dredging and capping given the potential risks posed by such activities and cost efficiency considerations. The Proposed

Plan acknowledges that natural processes can improve sediment quality over time stating: "when the cleaner sediment is deposited on and mixed into the contaminated surface sediment within the Site, the overall contaminant concentration in the surface sediment is reduced; thus reducing the exposure to the contamination" (Proposed Plan page 30); hence reducing Site risks over time. However, the Proposed Plan does not include sufficient analysis of the rate of natural recovery. It is critical that a robust analysis of the rate of natural recovery is incorporated into the remedy selection process before the remedy is finalized.

During the RI/FS process, the LWG completed a substantial modeling effort to evaluate the relative differences between the alternatives in reducing sediment concentrations over the long-term. The results of the model, however, were not incorporated into the Proposed Plan. EPA rejected the LWG's modeling results, stating it believes "there is too much uncertainty in the current version of the HST model predictions to quantify reductions in sediment concentrations following the implementation of various remedial alternatives due to natural processes such as sediment deposition." FS, Section 4.1.2. Rather than seek further clarification or require further data, analysis or a different modeling approach, EPA apparently gave up on the effort for now, questioning "whether any model would be able to adequately predict future conditions." FS, Section 4.1.2.

While the rate of natural recovery can be difficult to assess with certainty at dynamic sediment sites such as Portland Harbor, this work nonetheless must be done. From the date on which construction commences on any the remedial alternatives B-I, there will be two forces at work at the Site: (1) the remedial action implemented over time; and (2) natural processes altering the levels of contaminants, which also will occur over time. Both factors must be evaluated to estimate outcomes and assess "long-term effectiveness and performance," one of five Primary Balancing Criteria for evaluating remedial alternatives. In dismissing the results of the LWG's modeling efforts without developing a different model, EPA has no means for assessing the long term effectiveness of any of the remedial alternatives. Until that work is complete, EPA therefore has no reasonable basis for comparing the remedial alternatives as required in the FS, nor does it have sufficient information to support its preferred alternative as described in the Proposed Plan.

In the Proposed Plan, this gap is masked because EPA compares the estimated sediment contaminant concentrations at the completion of construction (Time 0) to designated cleanup levels for select Remedial Action Objectives (RAOs). This comparison, however, captures only one point in time for each alternative and does not evaluate long-term effectiveness of the remedial alternatives. This analysis is also extremely misleading in setting the end date for each alternative as "Time 0" since each alternative will require a different period of time for completion, with EPA's duration estimates ranging from 4 to 62 years. Given the natural processes affecting sediment concentrations, it is possible that a less intrusive remedial alternative, such as EPA's Alternative B as described in the FS and Proposed Plan, will achieve the required risk reduction through a combination of active remediation and natural recovery decades before the more extensive remedies could be completed. Since EPA has not assessed that possibility, it currently has no basis for rejecting it. Moreover, EPA does not even attempt to estimate when any remedial alternative will achieve the cleanup goals, if ever, nor is it able to compare the relative time required for each alternative to do so.

Since the Proposed Plan and FS do not include sufficient information for a quantitative evaluation of the rate of natural recovery, many of EPA's statements in its comparative analyses of remedial alternatives are qualitative and subjective, lacking any identified support, explanation or standards. Below are few examples of such unsupported assertions in the Proposed Plan and FS:

- At page 4-88 of the FS, EPA states: "Alternatives B and D may not be protective of the environment because of the timeframe needed to achieve PRGs through MNR and ICs would not provide protection ecological [sic] receptors during this time period." EPA, however, provides no analysis of the timeframe needed for these alternatives to achieve cleanup goals for purposes of comparing them to the other alternatives.
- At page 4-95 of the FS, EPA states: "Alternative B relies more on MNR to achieve PRGs and would have the longest impact to the community and environment until RAOs are achieved." EPA has provided no information supporting the conclusion that a more protracted remedial action will achieve PRGs or RAOs sooner than a remedy with a shorter construction timeframe followed by MNR. EPA also has not shown how the difference in the timeframes to achieve RAOs between the alternatives justifies the difference in costs when conducting the cost-benefit analysis, nor has EPA even attempted to evaluate many of the impacts the community will suffer during implementation as described in subsequent sections below.
- At Page 54 of the Proposed Plan, EPA states: "The time needed for MNR to achieve the RAOs for each alternative is uncertain, but is likely to occur more quickly in areas of deposition and for alternatives with a larger remedial footprint." However, EPA makes no attempt to assess the relative speed compared to the significant differences in costs.

Such statements are vague and overbroad, adding nothing meaningful to the remedy selection process.

In the absence of sufficient information in the FS and Proposed Plan to support a quantitative analysis of natural recovery, EPA states that it "will rely on a robust post-construction monitoring program to track sediment and fish tissue contaminant concentrations and their progress toward remedial goals" and that "this prospective, empirical approach will provide a clear basis for measuring progress toward achieving RAOs and [sic] over time, and the data collected will provide a firm basis for post-construction projections, if necessary." FS, Section 4.1.2, p. 4-5. However, for the reasons discussed above, this information is needed now to determine which remedy is appropriate.

A more thorough quantitative evaluation of the rate of natural recovery is therefore required before EPA can finalize its remedy selection. The most direct means for developing further information is to measure the change in contaminant concentrations over time. This data is already available. For example, data collected in 2012 and 2014 documents statistically significant reductions in surface polychlorinated biphenyl (PCB) sediment and fish tissue concentrations. *See, e.g., Portland Harbor: State of the River in 2014* and supporting data, Kleinfelder, September 2015. This data further shows that the calculated site-wide surface weighted average concentration (SWAC) for the Site has decreased below the assumed SWAC levels used in the FS. *Id.* While EPA rejected the LWG's model as too "uncertain," this recent data yields results generally consistent with the LWG's model, which showed that sediment quality is improving, and will continue to improve, through the process of natural recovery.

If EPA nonetheless believes that the available data together with the LWG's prior modeling work is not sufficient to support an assessment of the rate of natural recovery, it should revise the Proposed Plan to expressly address the additional data available as of this date, and to describe

the efforts to be undertaken to obtain the additional information it believes is required to complete this key portion of RI/FS process before the remedy selection is final.

Section Conclusions:

- The Proposed Plan should expressly acknowledge that additional information and analysis regarding the rate of natural recovery must be incorporated into the remedy selection process before the final remedy can be identified.
- The Proposed Plan and FS should address the additional data regarding the rate of natural recovery at the Site and re-evaluate the LWG's model to re-assess whether the new information is sufficient to establish a rate of natural recovery to be applied in the FS and Proposed Plan. If EPA concludes that this additional information is not sufficient, it should expressly describe the basis for that determination and identify the additional information and analysis it believes is necessary.
- Until sufficient information regarding the actual rate of natural recovery is obtained and incorporated into the remedy selection, EPA should revise the Proposed Plan to identify with specificity those calculations, analyses and conclusions in the Proposed Plan and FS that may need to be altered when the additional information is incorporated.
- Among the aspects of the Proposed Plan and FS that need to be altered once additional information regarding natural recovery is obtained are the FS's analyses comparing the various remedial alternatives and the portions of the Proposed Plan identifying and discussing EPA's preferred alternative.

D. PRGs Must Be Re-Assessed

Once EPA incorporates the new re-baselining data regarding current Site conditions and analysis of the rate of natural recovery, it should also re-examine the analysis underlying the numerous and extremely conservative PRGs described in the Proposed Plan. As discussed below, EPA's current approach is unwarranted and has resulted in overly-restrictive PRGs for an unworkably large number of substances. Many of these PRGs likely cannot be achieved in a realistic timeframe or maintained given any realistic assessment of future source inputs.

Both COCs and PRGs must be selected based on technically-defensible rationales and sound risk management principles. See Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites. OSWER 9285.6-08. February 12, 2002. In that process, only those contaminants identified as posing unacceptable human and/or ecological health risks at this Site should be included. See Role of the Baseline Risk Assessment in Superfund Remedy Selection Decision. OSWER 9355.0-30. April 1991. Of the COCs identified, the remedial action should then focus on those COCs that pose the greatest health risk and where PRGs can be achieved through a sediment cleanup. Therefore, development of COCs and PRGs should focus on risk driver chemicals, and COCs and PRGs should not be included if risk assessments indicate that a chemical is not significantly contributing to risk, or where evaluation of a COC is not necessary to select a protective remedy. Typically, PRGs are developed for a subset of COCs, known as "risk drivers," based on human and ecological health risks. This distinction based on the level of risk is particularly necessary where cleanup of those COCs will address other, co-located COCs.

Focusing on key risk driver COCs allows the remedy screening process, remedy implementation, and long-term monitoring requirements to be simplified greatly. Risk driver COCs are generally

determined based on several lines of evidence, including: (1) the relative percentage of the total human health risk and the absolute magnitude of the risk posed by the COCs; (2) frequency of detection; (3) uncertainty associated with risk conclusions; (4) data quality; and (5) background concentrations. The final selection of the appropriate COCs and associated PRGs should be based on balancing all of these lines of evidence.

In the absence of current baseline data and a complete analysis of the rate of natural recovery, EPA is currently ignoring reasonably conservative risk management approaches in selecting numerous COCs and PRGs for the Site. Contrary to risk management principles, the FS and Proposed Plan include all COCs for PRG development rather than focusing on the risk driver chemicals for the Site. This departure from standard practices makes the FS and Proposed Plan unnecessarily complex and difficult to follow. In addition to focusing on all COCs, EPA has also selected the lowest PRG across all risk scenarios, which may not be appropriate to apply in certain areas and within certain spatial scales. For example, recreational beach-user PRGs should only apply to recreational beaches. In presenting only the lowest value by media, the analysis fails to provide the proper context as to how the PRGs should be applied since it omits the entire basis of the exposure pathway that the PRG is intended to protect.

This overly-conservative approach in the Proposed Plan and FS has led EPA to identify an astonishing fourteen sediment PRGs purportedly aimed at addressing human and ecological health risk at the Site. See Proposed Plan, Table 11. This approach and its outcome are wholly inconsistent with EPA's process and the result at other sites as summarized below:

- **Lower Duwamish Waterway (LDW) Superfund Site** – In the 2014 ROD for the LDW site, EPA Region 10 identified four COCs as human health contaminants of concern: PCBs, arsenic, carcinogenic polycyclic aromatic hydrocarbons, and dioxins/furans. While numerous other chemicals were found at the LDW site exceeding risk thresholds (e.g., pentachlorophenol, tributyltin, vanadium, and several pesticides), most were not selected as COCs due to their low contribution to overall risk, low detection frequency, and/or data quality concerns.
- **Lower Passaic River Study Area** – The 2016 ROD for the Lower Eight Miles of the Lower Passaic River identified four substances for risk-based PRGs, stating “[w]hile all of the COCs discussed... cause unacceptable risks to some or all of the receptors evaluated, risk-based PRGs were developed for dioxins, PCBs, mercury and Total DDX, because they are representative COCs (based on the magnitude of HQs and number of receptors affected) and because there were multiple lines of evidence developed to evaluate how the alternatives would achieve PRGs for these four COCs after remediation.”
- **Fox River and Green Bay Site Operable Units 1 and 2** – As described in the 2002 ROD for this site, a Screening Level Ecological Risk Assessment identified 75 chemicals that exceeded screening levels. Of those, however, only eight were retained for analysis as chemicals of potential concern (COPCs): PCBs, dioxins, furans, DDX, dieldrin, arsenic, lead, and mercury. Of those, it was determined PCBs posed the majority of the health risk, and were also co-located with all of the evaluated COPCs. Therefore, PCBs were selected as the primary COC, and a remedy was selected that effectively addressed PCB exposure; and the remedy was assumed to address the other COPCs with lesser toxicities in the sediment.

- **Grasse River Superfund Site** – In the 1993 Baseline Human Health and Ecological Risk Assessments for this site, numerous chemicals posing potential risk were identified, including PAHs, dioxins/furans, phthalates, and metals. Of these, PCBs were found to be the primary risk driver for all human and ecological exposure scenarios. Therefore, 2001 revisions to the baseline human health risk assessment and the 2010 baseline ecological risk assessment focused solely on PCBs. In the 2013 ROD, EPA identified PCBs as the sole COC/risk driver and selected the remedy to address PCBs with the assumption that it also would address any other chemicals of interest.

EPA's departure from the standard approach to COCs and PRGs poses significant problems for the Proposed Plan and could needlessly complicate, delay and undermine future efforts at the Site.

Because the Proposed Plan has identified so many PRGs at such low levels, it is extremely unlikely that all PRGs can ever be attained under any of the alternatives assessed in the FS. Many of the COCs are ubiquitous in the environment, and most are associated with a broad range of urban and agricultural uses. Nonetheless, the PRGs for many of these substances are set below anthropogenic background. Even if additional remedial actions are required beyond any assessed in the FS, it is unlikely that all PRGs could be reached across the Site in a reasonable timeframe. It is unrealistic to assume that the Site will meet these targets in the future and requiring monitoring in perpetuity of such low levels after the remedy is constructed would not make sense.

In establishing so many PRGs at such low levels, EPA would virtually guarantee that the cleanup goals for the Site cannot be attained. While EPA may prefer to address the question of attainability later, for example, after the remedy fails to achieve its goals, applicable regulations and Agency guidance require that these considerations be addressed during remedy selection. See, e.g., 40 C.F.R., Section 300.430(f)(1)(i)(B) ("implementability" is a "primary balancing criteria" in the selection of the remedy); *see also* Transmittal of Policy Statement: "Role of Background in the CERCLA Cleanup Program." From Michael B. Cook, Director of Office of Emergency and Remedial Response to Superfund National Policy Managers Regions 1 – 10. OSWER 9285.6-07P. May 1, 2002, Washington, D.C. (cleanup goals must be achievable); *accord* Contaminated Sediment Remediation Guidance for Hazardous Waste Sites. EPA 540-R-05-102. OSWER 9355.0-85. December 2005, Washington, D.C.

Without an achievable end-point, there is no way to know if or when the remedy will be complete, or what future remedial actions may be required in addition to those described in the Proposed Plan. Rather than address this problem head on and offer a solution, the Proposed Plan fails even to acknowledge this fact. This hole in EPA's assessment is extremely troubling. In establishing unattainable PRGs, the Proposed Plan is setting unrealistic expectations for the public and discouraging the willing performance of cleanup activities under consent agreements if participants are required to agree to an open-ended obligation for what could be an endless loop of costly projects and additional remedial actions in an attempt to achieve unattainable PRGs.

In addition, the Proposed Plan does not clearly explain how long-term monitoring can be implemented with so many PRGs and no risk drivers clearly identified. In the Proposed Plan, EPA states that short-term monitoring will be conducted during construction and post-construction until all PRGs met. *See* Proposed Plan, p. 33. Taken literally, this statement would require monitoring for many of chemicals included on the extensive PRG list in perpetuity since the low levels established by EPA for many substances will likely never be met. Moreover, the unnecessarily long list of COCs and PRGs is confusing to the public, diverting attention away from those COCs that need to be addressed in the remedy.

In addition to the fourteen sediment PRGs in the FS and Proposed Plan, EPA has also proposed eighty-three PRGs for other media (surface water, groundwater, and fish tissue). EPA long ago made the determination that this RI/FS and remedy selection process would address "the in-river portion of the Portland Harbor Superfund Site," which should have focused on sediment as a media. See, e.g., Proposed Plan, p. 1. As noted in Section III below, EPA agreed in 2001 that DEQ would oversee source control efforts through a separate process and would therefore be responsible for media such as riverbanks.

Rather than establishing PRGs for other media in addition to sediment, EPA should instead do what it has done at other sites and propose target concentrations as needed to track the remedy's progress toward achieving the Remedial Action Objectives (RAOs). For example, at the LDW, EPA Region 10 set target levels for fish tissue and surface water. EPA stated that they selected these target tissue concentrations and surface water applicable or relevant and appropriate requirements (ARARs) to measure progress towards achieving RAOs and assess the success of the selected remedy in conjunction with uplands source control. In so doing, EPA made clear in the LDW ROD that these target levels will *not* serve as cleanup levels and are to be used for informational purposes only. The Proposed Plan and FS for the Site should be revised to incorporate that same approach here.

Section Conclusions:

- The Proposed Plan and FS should be revised to focus on sediment COCs and PRGs for which acceptable risk levels can be achieved through a sediment-only cleanup and for the COCs that significantly contribute to Site risk.
- PRGs should be set for sediments only and should not be established for tissue, soil, surface water, or groundwater under this remedy selection process since those media are being addressed by the DEQ in accordance with an agreement between EPA and the State. The Proposed Plan and FS should therefore be revised to evaluate those other media for possible target concentrations rather than PRGs.
- Target concentrations should not be used as enforceable cleanup levels or for the purpose of evaluating remedy compliance, but only to evaluate contamination trends.

E. EPA Misrepresents the Risk Reduction Benefits of its Preferred Alternative I

Under the Superfund Evaluation Criteria, the preferred alternative must be selected based on an evaluation of nine criteria set forth in the National Contingency Plan. See 40 C.F.R., Section 300.430(f)(1)(ii)(C)(3). These include two threshold criteria of "Overall Protection of Human Health and the Environment" and "Compliance with ARARs," five balancing criteria, and two modifying criteria. These criteria provide the foundation for the remedy selection process. At the Site, EPA has developed nine RAOs with interim risk targets for the Site, with the stated goal of reducing current and potential future risks to both human health and the environment to acceptable levels. To compare the alternatives and select the remedy, the relative risk reductions that each alternative would attain must be evaluated. The Proposed Plan and FS, however, include various statements that exaggerate or misrepresent the benefits of its preferred Alternative I, including some that conflict with EPA's own evaluation of applicable criteria.

For example, in its August 2015 Draft Feasibility Study (2015 Draft FS), EPA determined that all of the active remedial alternatives evaluated, including Alternatives B through G, would be protective of human health and the environment and would comply with ARARs. In its 2015 Draft FS, however, EPA reversed its position, stating that it no longer considers all of these alternatives protective. This change is not explained or justified. This lack of clarity continues into the Proposed Plan, where EPA states that Alternative I meets the NCP threshold criteria, but that the less intrusive and less costly Alternative D "*may* (emphasis added) meet the threshold criteria although there is more uncertainty with this alternative." The information EPA presents in the Proposed Plan appears to contradict this statement of uncertainty, however. For example, on page 51 of the Proposed Plan, EPA states that Alternatives D and I result in the same outcomes relative to the achievement of the risk targets for each RAO when evaluating the first threshold criteria. Additionally, the calculated residual risks post-construction are very similar between Alternatives D and I.

Despite EPA's conclusion that Alternative D and Alternative I result in the same outcomes, EPA still suggests in the Proposed Plan that Alternative I would make the river "safe" while a less intrusive alternative like Alternative D would not. This conclusion conflicts with the criteria evaluation and must be deleted.

The Proposed Plan also fails to explain how the substantial additional costs of Alternative I's longer construction durations can be justified based on the relative benefits. The National Contingency Plan requires that the selected remedy be "cost effective," meaning that the "costs are proportional to its overall effectiveness." 40 C.F.R., Section 300.430(f)(ii)(D). Therefore, remedial alternatives with a higher cost must be justified based on an assessment of their ability to achieve greater risk reductions than less expensive alternatives. While EPA presents Alternative I as achieving substantial risk reduction relative to the less intrusive remedial alternatives, EPA does not demonstrate that the actual risk reduction achieved by Alternative I is materially greater than the risk reduction provided by Alternative D, which EPA estimates will cost \$120 million less in capital costs than its preferred Alternative I (although the actual cost difference will likely be much greater, for the reasons discussed in Part V below).

Perhaps most significantly, the Proposed Plan misrepresents the benefits of preferred Alternative I with respect to fish consumption. While EPA acknowledges in the Proposed Plan that all of the remedial alternatives in conjunction with MNR and institutional controls "are expected to be protective of human health," it contends that the more expensive remedies with longer construction durations are less reliant on fish advisories for achievement of that level of protection than less intrusive alternatives. *See, e.g.*, Proposed Plan, p. 50. In fact, none of the cleanup alternatives evaluated by EPA will allow all fish advisories to be lifted since none will lower the risk posed by the background mercury content of resident fish at the Site. Mercury impacts are watershed-wide and cannot be addressed by any remedy performed at the Site. To date, EPA has done little to challenge the public misperception that remediation of the Site will allow all fish advisories to be lifted. While the Proposed Plan also notes that Alternative I would allow advisories to be relaxed to allow approximately 50 fish meals every 10 years, as opposed to 30 fish meals for Alternative D, EPA does not even attempt to explain how this difference of two additional fish meals per year justifies the substantial additional costs of Alternative I. EPA must correct the misunderstandings regarding fish advisories and revise the Proposed Plan to expressly reference the impact of mercury and other relevant watershed-wide contaminants and present a more complete and frank assessment as to the actual likelihood of advisories being lifted for each remedial alternative. Only then will the public be able to provide more meaningful comments on these issues and evaluate the actual costs and benefits of each alternative.

Section Conclusions:

- The Proposed Plan and FS include various statements that exaggerate or misrepresent the benefits of EPA's preferred Alternative I.
- EPA should explain its reversal of its prior conclusion as stated in the 2015 Draft FS that all of the active remedial alternatives evaluated would be protective of human health and the environment, and explain and justify its new conclusion that Alternatives B and D "may" not be protective.
- The Proposed Plan and FS should be revised to explain how the substantial additional costs of the alternatives with longer construction durations can be justified based on the relative benefits. For example, EPA must explain how risk reductions under Alternative I are materially greater than those under Alternative D and state why it believes that difference justifies the substantial additional cost.
- Given watershed-wide mercury impacts not specific to the Site, no Site remedy would allow for all fish advisories to be lifted. The Proposed Plan and FS should be revised to correct the public's misimpression in this regard, to reference the impact of mercury and other relevant watershed-wide contaminants, to present a more complete and frank assessment as to the actual likelihood of advisories being lifted for each remedial alternative and to incorporate this additional analysis into the comparison of remedial alternatives.

F. Technology Assignment Flowcharts Must Be Revised

EPA should also revise its technology assignment flowcharts and incorporate the new data regarding current Site conditions and the rate of natural recovery when available. These flowcharts have great significance in the Proposed Plan since they constitute the primary source of information presented regarding the specific technologies to be applied in the remediation.

As an initial matter, it is unclear whether EPA expects the flowcharts to be followed literally. If so, the Proposed Plan should be revised to state that position expressly and to include much more information and details, such as the basis for selecting capping versus dredging and the requirements for engineered caps. Additionally, the FS text does not explain if or how these technology assignments can be modified during remedial design based on updated information on site specific conditions or more appropriate technologies to reflect flexibility due to current information gaps.

As an example, EPA's capping requirements described in the flowcharts, if read literally, are extremely rigid and prescriptive. Different types of caps may be just as effective, or more effective, than the caps described by EPA. However, the flowcharts do not expressly allow any such additional information to be considered. In fact, in some portions of the Site, such as where groundwater plumes have been identified, EPA's prescriptive caps may not be effective in addressing the groundwater contaminants. EPA's blanket requirement that 5% organic carbon be used in reactive layers of caps and in addressing dredge residuals may prove unwarranted and unworkable and could be very expensive to implement with no little or no commensurate benefit as discussed in Section IV.B below. A lower organic carbon content may be just as effective with less risk of impacts to benthic organisms. In the Lower Duwamish Waterway Superfund Site, an Enhanced Natural Recovery pilot project is currently being conducted to evaluate the effectiveness

of the addition of organic carbon to caps. That study could provide valuable information for the cap designs at Portland Harbor. EPA should ensure that the results of that study can also be incorporated into the remedy selection process at Portland Harbor. Neither the Proposed Plan nor the FS includes any significant assessment of these significant issues.

As presented in the Proposed Plan, these flowcharts do not expressly identify any means for incorporating new data into the technology assignments. As drafted, they are too restrictive, and could be interpreted as foreclosing any opportunities to consider site-specific conditions or allow consideration of other technological options that may be identified during remedial design.

To illustrate how EPA could incorporate additional required information and greater flexibility into its technology assignment flowcharts, attached as Appendix A is a proposed alternative technology assignment flowchart for EPA's Navigation Channel and Future Maintenance Dredge Areas Technology Assignment Figure (see Proposed Plan, Figure 10a) offered as an exemplar to specify that would allow for the inclusion of additional data and analyses. SSI and MMGL urge EPA to review Appendix A in re-assessing all technology assignment flowcharts in the Proposed Plan. The proposed flowchart at Appendix A also addresses additional issues including concerns with EPA's approach to PTW, which are discussed in subsequent sections below.

Section Conclusions:

- The technology assignment flowcharts in the Proposed Plan are far too rigid and prescriptive, particularly given the current information gaps and additional data and analysis regarding current site conditions, background concentrations and technical practicability that must still be completed.
- Additional information must be compiled and further analysis must be performed before any final decisions can be made regarding the specific types of caps that may be required under different scenarios and for different conditions. The Proposed Plan and FS should be revised to acknowledge this fact and to identify the additional information and analysis required.
- If EPA decides to proceed with the ROD now, before this additional information and analysis is available, it should revise the technology assignment flowcharts to ensure that they are sufficiently flexible and non-prescriptive to allow this additional information to be incorporated into the selection of technologies.

G. Technical Impracticability Waivers Should Be Expressly Included

At complex sediment sites, it is not feasible to predict the course of cleanup efforts with great certainty or to foresee every possible change in circumstance. At many sites, EPA has therefore incorporated provisions into the ROD for technical impracticability (TI) waivers to allow EPA to adapt to circumstances or additional information. Such TI waivers are site-specific waivers for specific contaminants. EPA has expressly acknowledged that: "TI waivers are one of the means of waiving ARARs consistent with CERCLA Section 121(b) and the NCP [see Section 300.430(f)(1)(ii)(C)(3)]. Through analysis of site data and demonstration of the impracticability of achieving ARARs...a waiver may be appropriate." Summary of Technical Impracticability Waivers at National Priorities List Sites, OSWER Directive 9230.24, August 2012, Washington, D.C.

At the LDW site, for example, EPA acknowledged that it is very unlikely that the low cleanup levels for PCBs for that site can be achieved. EPA therefore expressly addressed this issue in the LDW

ROD, stating; "...EPA expects that, once the active components of the Selected Remedy have been completed and long-term monitoring shows COC concentrations have reached a steady state, COC concentrations will either be at cleanup levels for sediment and ARARs for water quality, or will represent practicable limitations in implementation of source control and active remediation. If EPA determines that no additional practicable actions can be implemented under CERCLA to meet ARARs, EPA may issue a ROD Amendment or ESD providing the basis for a technical impracticability waiver for specified sediment and/or surface water quality based ARARs under Section 121(d)(4)(C) of CERCLA..."

Given the complexity of Portland Harbor, the ROD should expressly include an option for TI waivers. If EPA decides to proceed with the final ROD now before the additional information described above is incorporated, provisions expressly allowing for such TI waivers will be particularly important since the remedy will likely be unattainable. For example, if EPA decides to issue a ROD now with the PCB PRG set at 9 ppb, it should acknowledge in the ROD that it is highly unlikely this PRG can be achieved across the Site under any realistic scenario and should expressly state that TI waivers from the PCB PRG may be issued once the Site reaches equilibrium.

While the opportunity for TI waivers may provide an efficient means of addressing unexpected events, they are no substitute for an informed assessment of implementability or technical impracticability. As noted above, those assessments are an essential part of the remedy selection process and cannot be deferred to later stages based on the possibility of future waivers.

Section Conclusions:

- The Proposed Plan should be revised to state expressly that EPA will consider TI waivers as needed once the Site reaches equilibrium upon implementation of the work described in the ROD.

III. THE PROPOSED PLAN SHOULD BE REVISED TO REMOVE OR CORRECT REQUIREMENTS FOR MEDIA OUTSIDE THE SCOPE OF THE RI/FS AND REMEDY SELECTION PROCESS

As noted in Section II.C above, the RI/FS and remedy selection process address only the "in-river portion of the Portland Harbor Superfund Site." Proposed Plan, p. 1. In 2001, EPA entered into a Memorandum of Understanding (MOU) with DEQ, other government agencies, and several tribes intended "to provide a framework for coordination and cooperation in the management of the Site." The MOU designated EPA as "Lead Agency" for the "In-Water Portion of the Site" but identified DEQ as "Lead Agency" for the "Upland Portion of the Site." Under the MOU, EPA and the DEQ agreed that DEQ would "enter into response action agreements with or issue orders to [potentially responsible parties] pursuant to state authority, for remedial investigation, early action, and/or source control implementation." The MOU designated EPA as the "Support Agency" with the ability to "review and comment on key proposed source control decisions [by DEQ], but vested authority in DEQ for decisions including: (i) the "[d]etermination whether an upland site is a current source of contamination to the river and sediments; (ii) the "selection of a source control measure; and (iii) the [d]etermination that a source control measure has been satisfactorily performed."

For fifteen years, EPA and DEQ proceeded under the MOU, with EPA overseeing the in-river RI/FS and DEQ overseeing source control. Under this rubric, EPA focused on selecting a remedy for

contaminated sediments, while DEQ addressed source media including soils, surface water, river banks, and groundwater. Over the past fifteen years, in accordance with the MOU, DEQ has issued orders and entered into agreements with property owners and operators addressing upland conditions and source media on properties throughout the Site's investigation area. Both SSI and MMGL are among the cooperating owners and operators who have entered into voluntary agreements with DEQ. Like many other owners and operators in Portland, they have undertaken substantial efforts at great cost to perform the work approved by DEQ. They did so in reliance on EPA's express representations in the MOU and elsewhere that DEQ is "Lead Agency" for those media with authority to make the necessary determinations regarding potential sources and source control measures.

After maintaining this arrangement with DEQ and the Portland community for fifteen years, now – in the final stages of the remedy selection process – EPA seeks unilaterally to depart from its MOU to impose new and conflicting requirements for source media including river bank soils and groundwater. As discussed below, the portions of the Proposed Plan that purport to impose such cleanup requirements on media outside the scope of the RI/FS and remedy selection process must be revised since they are not supported by sufficient data or analysis, conflict with DEQ's efforts, and threaten to upend numerous enforceable agreements between DEQ and cooperating parties, further eroding the regulated community's confidence in EPA's process and undermining the Agency's ability to partner with the community moving forward.

A. Characterization and Cleanup of Riverbank Soils Should Remain Under DEQ Oversight And Should Not Be Subject to Potentially Conflicting EPA Requirements

1. Characterization of Riverbank Soils

In the final year of a sixteen-year RI/FS process, EPA now unilaterally seeks to expand the scope of the RI/FS and remedy selection process beyond the "in-river portion" of the Site to include river banks as a new key element of the Proposed Plan and FS. In this last-minute reversal, EPA has added a new RAO, "RAO 9," intended to address river banks by establishing new goals and requirements directed specifically at this media. This change represents a marked departure from the sixteen year RI/FS process to date. The 2012 Draft FS prepared by the LWG did not include any RAO 9, and instead noted, consistent with the MOU, that DEQ is the lead agency responsible for identifying and controlling upland sources adjacent to the Site, including contaminated river banks. As recently as February of this year, EPA confirmed this long-standing arrangement not to include river banks as part of the Portland Harbor Study Area in the recent Final Remedial Investigation Report (Final RI) issued in February 2016. At that time, EPA noted that some river banks could be a source of contamination to the Study Area or Site, but stated that "[t]he occurrence and relative importance of riverbank contamination is not well characterized for all parts of the study area, but is a focus of DEQ's source control investigations" EPA, Final RI, Section 4.3.4.

EPA's sudden reversal in adding the new RAO 9 for river banks is not explained in the Proposed Plan. It is therefore unclear why EPA now believes that it is necessary for it to intrude into DEQ's role as Lead Agency for river bank characterization and cleanup.

Moreover, neither the Proposed Plan nor the FS identify sufficient information or analysis to support EPA's conclusions as to the areas purportedly constituting "contaminated riverbank." In identifying contaminated river banks for the Proposed Plan and FS, it appears that EPA selected

the entire river bank of a property if that property was identified in DEQ's Environmental Cleanup Site Information (ECSI) database as having a contaminated river bank. If so, EPA has misconstrued DEQ's findings. In identifying river bank as "contaminated" for its purposes, DEQ was not making a determination that each of those river banks is a contributing source of COCs to the River or in-water sediment. Rather, it was merely noting that some contaminant exists on the bank at that location. For example, DEQ's findings were not intended to take into account the physical characteristics of the river banks, the locations where contamination was identified along the bank, or the specific contaminants or concentrations detected. For EPA to use that list for purposes of the FS and Proposed Plan is extremely misleading.

As a result of EPA's misapplication of DEQ's prior findings, the Proposed Plan and FS overstate the number of properties with contaminated river banks that may be contributing to in-river impacts. For example, the shoreline impacts at the GS Roofing and Hampton Lumber and Glacier NW property that caused DEQ to identify those properties as having contaminated riverbanks bear no obvious relation to in-river contamination in sediments adjacent to those properties. Nonetheless, these properties, apparently without any further inquiry, were swept into the "contaminated riverbank" requirements of the Proposed Plan and FS.

In misapplying DEQ's list of "known contaminated river banks," EPA also failed to take note of DEQ's conclusions summarized in its 2014 *Portland Harbor Upland Source Control Summary Report* that further work is required to refine the extents of contaminated river bank at these properties. Instead, it appears EPA chose to use sediment data in the vicinity of the river banks to project the approximate extent to which a property's bank may require remedial action based on each remedial alternative's RALs. See FS, Appendix D. In so doing, EPA has failed to present an adequate analysis of the available river bank data and information necessary to support the conclusions regarding river bank cleanups.

In fact, it appears that EPA does not have a complete understanding of existing river bank data or prior source control efforts overseen by DEQ. For example, the list of properties identified in the Final RI as "known" or "likely" historical or current river bank erosion pathways (Final RI Table 4.2-2) does not accurately correspond with the list of properties with contaminated river banks that EPA presented in the FS and Proposed Plan. Multiple properties identified as having insufficient data to make a determination of a river bank erosion pathway in the Final RI are now listed as properties with "known contaminated river banks" requiring cleanup in the Draft FS and Proposed Plan, with no explanation.

One example of EPA's misapplication of river bank data is its treatment of SSI's Burgard Yard property. In the FS and Proposed Plan, EPA identifies the northern edge of the Burgard Yard property on the south shore of the International Slip as well as the entire western riverfront edge of the property as "contaminated riverbank." See FS, Section 1.2.3.5. In support of this determination, EPA refers to soil samples collected under the dock on the International Slip. See id. However, all of the corresponding FS figures referencing contaminated riverbanks outline the entire shoreline of this property, not just the soil along the southern edge of the Slip. As noted in DEQ's 2014 Portland Harbor Upland Source Control Summary Report (Page 70), "the [Burgard Yard] riverbank along the Willamette River is heavily armored by riprap to prevent erosion, and DEQ therefore excluded the pathway [erosion of the riverfront shoreline]" based on its evaluation of site conditions. DEQ's determination is reflected in a corresponding figure (Figure 4.5.7) from the Portland Harbor Upland Source Control Summary Report that does not identify river bank contamination for this portion of the riverbank. However, it appears EPA misconstrued a substantial volume of data compiled under DEQ oversight. In fact, EPA's river bank soil database

erroneously ascribes to Burgard Yard more than 3,500 data entries relating to a different property several miles upstream on the opposite shore. Specifically, EPA incorrectly assigned data DEQ labeled as relating to "Schnitzer ASD Yard Riverbank Feasibility Study" collected at a property at River Mile 9 West to Burgard Yard at River Mile 3.5 East.

These errors and apparent misunderstandings of the voluminous existing data and numerous prior findings by DEQ in its long history overseeing the characterization and cleanup of river banks in this area may be explained by the fact that EPA has not, until recently, been significantly involved in overseeing any of these efforts given its agreement with DEQ as reflected in the MOU. However, the issues identified above underscore the potential dangers in EPA attempting at this late date to intrude into DEQ's role as lead agency for river bank characterization and cleanup.

While the descriptions of the remedial alternatives in the text and tables of the Proposed Plan and FS include general information on the assumed total areas or extents of the contaminated river banks requiring remediation (e.g., total excavated volumes, total area requiring capping, or total length of river bank remediated), EPA fails to provide associated figures that show how these areas vary by alternative. The lack of information on contaminated river banks in the Proposed Plan and FS makes it impossible to ascertain what assumptions EPA used to reach their conclusions on the required remediation for these river banks under any of the alternatives.

Section Conclusions:

- In its 2001 MOU with DEQ, EPA agreed that DEQ is lead agency for the "Upland Portion of the Site." Characterization of riverbanks should remain under DEQ oversight and should not be subject to any potentially conflicting requirements by EPA.
- In using DEQ's list of properties with "contaminated riverbanks" to identify riverbanks that may require characterization or cleanup as part of the in-river remedy, EPA is being over-inclusive since DEQ's list includes properties where the contaminants that triggered DEQ's classification have been shown to have no documented pathway to the River or do not match the COCs in adjacent sediments.
- EPA's depictions of "contaminated riverbank" are also over-inclusive since they depict the entire shoreline of properties as "contaminated" when only a portion may fall into that designation as defined by EPA.
- EPA's river bank soil database has incorrectly ascribed to Burgard Yard at River Mile 3.5 East more than 3,500 data entries for riverbank data that actually relate to a different property several miles away on the opposite shore at River Mile 9 West.

2. Cleanup of Riverbank Soils

Over the past 15 years, DEQ has overseen numerous remedial actions along the River that have included riverbank cleanups. Some of those efforts have already been completed while others are underway. Now, however, EPA is seeking to interject itself into the process by proposing to establish new requirements. As discussed below, many of these requirements are not supported or sufficiently explained and could conflict with DEQ requirements.

EPA's Contaminated River Banks Technology Assignments flow chart in the Proposed Plan and FS identify only three technology assignments for contaminated riverbanks:

- (1) for PTW areas with NAPL present or PTW defined as not reliably contained, the remedy is excavation with a significantly augmented reactive cap;
- (2) for contaminated riverbanks within RAL boundaries but outside PTW (NAPL or not reliably contained) areas, the remedy is excavation with an engineered cap; and
- (3) if the contaminated river bank is outside the defined RAL or PTW (NAPL or not reliably contained) areas, no action is required.

These technology assignments are confusing, vague, and, in some cases, contrary to the text of the Proposed Plan and FS. For example:

- As noted above, armored portions of shoreline should not be included in any definition of "contaminated riverbank" as used in the Proposed Plan and FS since soil erosion is likely impossible. This mismatch is further evidenced by the fact that neither of the technology assignments described above could be implemented in riprap areas. Additionally, the Proposed Plan states that other river bank areas may be added to the remedy if contamination contiguous with river sediment is discovered during remedial design. EPA has failed to clarify whether any sampling of these armored river banks will be required during remedial design and, if so, the type of sampling that may be appropriate. This omission from the Proposed Plan is a significant defect since armored river banks cover approximately half the Site's shoreline as acknowledged in the Proposed Plan and FS.
- EPA is requiring remediation of contaminated river bank areas with concentrations above RALs. It is unclear if or how any obligations would be applied at properties with riverbank contaminants not listed as RALs. Additionally, EPA has not clarified how the numerous PRGs identified in the Proposed Plan and FS will be met or whether they even apply in these river bank areas.
- The Proposed Plan states that "[t]he technology assignments for SMAs adjacent to identified contaminated river banks are extended to include those river banks." Proposed Plan, p. 36. A similar statement appears in Section 3.4.5 of the FS. These statements could be construed as indicating that technology assignments for the shallow sediment areas adjacent to these presumed contaminated riverbanks should also be applied to these riverbank areas. However, this interpretation appears to be inconsistent with the river bank technology assignment flow chart designations.
- While the river bank technology assignment flow chart does not include any distinctions for highly toxic PTW if identified on the river banks, text from the Proposed Plan and FS appears to state otherwise. On page 28 of the Proposed Plan and in Section 3.2.2.1 of the FS, the text states that, "[i]n intermediate, shallow and river bank regions of the site where PTW is left in place, either *in-situ* treatment or amendments to caps and post-dredging residual layers will be implemented." EPA should clarify whether this statement is intended to apply to highly toxic PTW on the river bank areas. The flow chart could be interpreted as indicating that, if highly toxic PTW is present on the riverbank, then an engineered cap without a chemical isolation layer would be used.

- EPA's river bank technology assignment flow chart also does not distinguish between areas where groundwater may be seeping out of the riverbank. However, on page 27 of the Proposed Plan, the text states that "[a]ll areas, including river banks, with known discharges of contaminated groundwater are assumed to require an in-river reactive cap to reduce the contaminant movement and limit potential exposures." Additionally, Section 3.3.2 of the FS text states that "a reactive cap is also assumed to be required in areas where contaminated groundwater may seep through river banks."
- EPA has not clearly indicated the depth of contaminated soil that would need to be excavated from a contaminated riverbank and what changes to the slope of the riverbanks would be required in the remedial action. For EPA's river bank calculations, EPA assumed a simplified scenario with excavation to an average depth of 3 feet and a slope of 3H:1V. However, it is unclear if EPA intends to require removal to a greater depth or until RALs are reached if riverbank contamination extends beyond a depth of 3 feet. Note that the depth of removal required is provided in the technology assignment flow charts for the in-water portions of the Site. Additionally, it is unclear if any changes to the vertical slope of the riverbanks will be required. The FS notes that many of the contaminated riverbanks currently have slopes that exceed an optimum slope of less than 5H:1V and that obtaining this desired slope may be precluded by operations or structures present near the river bank (Final FS Report Section 3.4.5).
- EPA's river bank flow chart does not indicate that beach mix is required in the riverbank capped areas that are prone to erosive forces, while the remaining river bank capped areas requires that vegetation be planted. However, these elements are specified in the Proposed Plan and FS text.

The foregoing issues are just a fraction of the questions that EPA would need to address if it decides to proceed with its plan to expand the RF/FS and remedy selection process to include riverbank areas. Given DEQ's long history of addressing riverbank issues in its ongoing source control and the likelihood of conflicting requirements, duplication and waste that would result from dueling requirements, SSI and MMGL urge EPA not to attempt to co-opt DEQ's process but allow it to continue in concert with EPA's in-river efforts as contemplated by the MOU.

Section Conclusions:

- Cleanup requirements for riverbanks should remain under DEQ oversight and should not be subject to any potentially conflicting requirements by EPA.
- Neither the Proposed Plan nor the FS includes sufficient information or analysis of riverbeds to support application of EPA's technology assignments.
- EPA's technology assignments for riverbeds are inapplicable to heavily armored portions of the shoreline, which constitute a significant portion of the shoreline within the Site. The Proposed Plan and FS should be revised to expressly acknowledge and address this issue.

B. Groundwater Impacts Should Remain Under DEQ Oversight And Should Not Be Subject to Potentially Conflicting EPA Requirements

During the RI/FS process, EPA required the LWG to undertake substantial efforts at great cost to evaluate groundwater at the Site. As noted in SSI's and MMGL's prior comments, the scope of this

effort as required by EPA was excessive given groundwater sampling conducted under DEQ's oversight in connection with source control efforts and DEQ's findings that groundwater is not a significant contributing source in most portions of the Site. In fact, many of the COCs identified by EPA for groundwater plumes (listed in Section 1.2.3.4 of the FS) are not listed as COCs for the Site sediments. Of the 39 PRGs for groundwater at the Site, 28 have *no* corresponding sediment PRGs. See Proposed Plan, Table 11. EPA's approach to groundwater indicates a fundamental mismatch between the types of soluble substances in groundwater, and the less soluble substances that persist in sediments. Moreover, DEQ's 2014 *Portland Harbor Upland Source Control Summary Report* notes for many of these upland sites that the sediment recontamination potential from the groundwater pathway are low.

The groundwater information presented in the Proposed Plan and FS also differs from the presentation in the Final RI. In any fact, after requiring the LWG to perform substantial work investigating groundwater, EPA largely ignored the results of that effort as reflected in the Final RI in drafting the Proposed Plan and FS. For example, Section 1.2.3.4 of the FS presents a list of groundwater plumes within the Site. However, EPA has not provided information or supporting data on how the approximate in-river groundwater plume extents as shown in Figure 5 of the Proposed Plan and Figure 1.2-19 of the FS were developed. The groundwater area maps that appear in the Final RI (Maps 4.4-3a-h) indicate both "the interpreted and potential" in-river groundwater plume discharge areas but do not directly correspond with the approximate in-river groundwater plume extents shown in the Proposed Plan and FS groundwater figures. The Proposed Plan and FS groundwater figures show more extensive areas of in-river groundwater plumes than are depicted in the Final RI groundwater maps.

As noted above, SSI and MMGL urge EPA not to attempt to expand the scope of the RI/FS and remedy selection process to include potential source media such as groundwater. As with EPA's new proposed approach for riverbank soils, EPA's approach to groundwater in the Proposed Plan and FS would intrude into DEQ's proper role under the MOU, virtually guaranteeing unnecessary duplication and inefficiency.

As an example, one of the issues that EPA would need to address if it includes groundwater plumes in the Proposed Plan is its inclusion of prescriptive remedies (such as reactive caps or reactive residual layers) for addressing areas with residual groundwater impacts at the Site. However, it does not appear that EPA has assessed whether these prescriptive remedies will be effective in addressing the groundwater contaminants in these identified plumes. The Proposed Plan notes that "[r]eactive layers are added to caps in areas where pore water exceeds PRGs to address groundwater plumes..." Proposed Plan, p. 64. Application of these prescriptive remedies to address effects from these residual plumes could be quite costly yet may be ineffective depending on the properties of the chemical in question. EPA should provide additional details as to the basis for requiring a reactive residual layer (defined as a 12-inch sand layer containing 5% activated carbon layer) for all dredged sediment areas identified as being in a residual groundwater plume area. EPA also should assess whether activated carbon will address the groundwater contaminants in the residual plume effectively and how much activated carbon is really necessary.

Section Conclusions:

- Characterization and any cleanup of groundwater plumes should remain under DEQ oversight and should not be subject to any potentially conflicting requirements by EPA.

- Many of the COCs identified by EPA for groundwater plumes (listed in Section 1.2.3.4 of the FS) are not COCs for Site sediments. Of the 39 PRGs for groundwater at the Site, 28 have *no* corresponding sediment PRGs. At a minimum, no PRGs should be established for groundwater COCs that are not subject to sediment PRGs.
- Neither the Proposed Plan nor the FS includes sufficient information or analysis of groundwater to support application of EPA's prescriptive remedies in plume areas.

IV. MISAPPLICATION OF THE PTW APPROACH MUST BE CORRECTED IN THE PROPOSED PLAN AND FS

The Proposed Plan and FS also incorporate an analysis of the PTW approach, which is a process intended to help categorize source material waste and to help identify appropriate remedies for areas deemed locations of principle threat wastes. As discussed below, the PTW approach used in the Proposed Plan and FS conflicts with EPA guidance and the Agency's approach at other sites. It also misapplies the results of the Site's human health risk assessment and grossly overstates the risks posed by many areas of the Site. EPA should revise the Proposed Plan and FS to correct these errors as summarized below.

A. The PTW Approach is Incorrectly Applied in the Proposed Plan and FS

In 1991, EPA issued guidance regarding "considerations that should be taken into account in categorizing waste for which treatment or containment generally will be suitable." EPA's 1991 "A Guide to Principal Threat and Low Level Threat Wastes" guidance document (Superfund Publication 9380.3-06FS) ("PTW Guidance"). This PTW approach is intended for use in characterizing "source material" based in its toxicity and mobility. Under this approach, source material can be categorized as PTW, low level threat waste or neither. *Id.*, p. 2. PTW is defined as "those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health of the environment should exposure occur." *Id.* Low level threat wastes "include source materials that exhibit low toxicity, low mobility in the environment, or are near health based levels." *Id.* Where waste "cannot readily be classified as either a principle or low level threat waste," no classification is required under the PTW approach and "no general expectations on how best to manage these source materials" will apply. *Id.*

EPA guidance states that "...[n]o 'threshold level' of toxicity/risk has been established to equate to a 'principal threat.'" PTW Guidance, p. 2. However, it concludes that "where toxicity *and* mobility of source material *combine* to pose a potential risk of 10^{-3} or greater, generally treatment options should be evaluated." *Id.* (emph. added). The guidance further clarifies that "determination as to whether a source material is a principal or low level threat waste should be based on the inherent toxicity *as well as* a consideration of the physical state of the material (e.g., liquid), the potential mobility of the wastes in the particular environmental setting, and the lability and degradation products of the material" (emphasis added).

The Proposed Plan and FS for the Site, however, apply a much more expansive definition of PTW than EPA guidance. They describe PTW as any (1) source material, that is non-aqueous phase liquids (NAPLs) within the sediments, (2) material containing highly toxic sediment concentrations (defined as concentrations exceeding a 10^{-3} cancer risk level) of select COCs, *or* (3) materials that could not be reliably contained by a specific cap. *See, e.g.*, Proposed Plan pp. 14-15. While guidance requires an assessment of both toxicity *and* mobility, the Proposed Plan purports to

designate various portions of the Site as the locations of PTW based on a finding that the material is **either** not reliably contained **or** "highly toxic." See, e.g., Proposed Plan, Figure 7. EPA then applies the PTW treatment and control standards in those areas despite the fact EPA has made no finding whatsoever that the material at those locations cannot reliably be contained.

The effect of this misapplication of PTW Guidance in the Proposed Plan and FS is substantial. Of the areas identified as locations of PTW, the vast majority were identified based solely on purported toxicity alone. See, e.g., Proposed Plan, Figure 7. Some areas were identified based solely on a finding that the materials cannot be contained reliably. *Id.* The areas identified as "PTW - highly toxic" and "PTW - not reliably contained" overlap in only a few very localized areas at the Site. Even these small areas do not meet the definition of PTW, however, since none of the substances that EPA contends fails under the "highly toxic" element in those areas also fails the "not reliably contained" element, or vice versa. In fact, both the Proposed Plan and FS acknowledge that all concentrations of PCBs, dioxins/furans, PAHs, and DDX measured at the Site can be reliably contained.

EPA's designation of certain areas as "highly toxic" for purposes of its PTW analysis is also flawed and extremely misleading to the public. While EPA purports to apply the 10^{-3} risk level as the basis for these designations, it calculates the purported risk of these areas not based on any direct exposure scenario but based on indirect fish consumption exposure scenarios that are inapplicable given the spatial scale of the PTW analysis. The fish consumption exposure pathway is based on sediment concentrations averaged over various spatial scales within the Site. The areas set for different fish species vary based on data regarding the species' home range, with some species having home ranges spanning multiple miles. In identifying sediment levels that may pose various levels of risk based on the fish consumption pathway, the human health risk assessment for the Site assumed sediment concentrations averaged over the spatial scales corresponding to each species' home range. Those spatial scales are critical to the analysis. In short, the risk posed by consuming fish that lived within a range of a mile or more that includes a few thousand square feet of sediments with a COC above a certain level is not the same as the risk posed by consuming fish that lived within a range where the average sediment concentration for the entire range exceeds that level. EPA, however, ignores this critical distinction, purporting to identify PTW where risk exceeds the 10^{-3} level for some areas that appear to be as small as 10,000 square feet or less. Even some of the larger areas identified by EPA are small in comparison to the home ranges for certain resident fish. Nonetheless, there is no indication in the Proposed Plan or FS that EPA is even aware of this mismatch between the risk levels from fish consumption exposure scenarios and its PTW analysis.

EPA's PTW approach reflected in the Proposed Plan and FS has generated distorted results that cannot be supported. Under this approach, any area of the Site where PCB sediment concentrations exceed 200 µg/kg is automatically designated as a "highly toxic" PTW area. This level is substantially lower than the levels set at other similar sediment sites as noted below. In addition, all these areas are automatically deemed locations of PTW whether or not contaminants can reliably be contained by capping without need for additional measures. As noted above, however, EPA simply ignores this essential part of the analysis. The Proposed Plan and FS should be revised to correct these errors and omissions.

Section Conclusions:

- While EPA's PTW Guidance requires an evaluation of both mobility and toxicity, under the PTW approach in the Proposed Plan and FS, various portions of the Site are

identified as locations of PTW based solely on alleged toxicity even though the waste in those areas has not been found to meet the criteria for "not reliably contained."

- EPA's assessment as to whether portions of the Site are locations of highly toxic PTW incorrectly misapplies the risk results from the fish consumption exposure pathway analysis since those risk results are based on dramatically different spatial scales than the PTW analysis.
- In misapplying data from the fish consumption exposure pathway analysis to the PTW analysis, EPA has grossly overstated the risks posed by various areas of the Site.

B. The Comparison of Remedial Alternatives and Technology Assignments Should Be Revised Once the PTW Approach is Corrected

EPA's approach to PTW reverberates throughout the FS and Proposed Plan. In fact, EPA suggests that its PTW analysis formed part of the basis for the remedy selection at this Site, asserting that only the more aggressive alternatives (Alternatives E-I) address all PTW at the Site. The FS notes that the other remedial alternatives do "not meet the statutory preference for addressing all principal threat wastes to the maximum extent practicable," suggesting that EPA's flawed PTW analysis is the basis for its decision dismissing entire alternatives. *See* FS, pp. 4-34 and 4-48).

EPA's PTW approach reflected in the Proposed Plan and FS has also strongly influenced EPA's technology assignments. In the technology assignment flowcharts, EPA identifies PTW as the first factor influencing the technology assignment – areas identified as locations of PTW are generally required to follow a separate path in the flowchart in determining the remedy that will be required. *See* Proposed Plan, Figures 10a-d. For all flowcharts except the one for contaminated riverbanks, if sediments are identified as highly toxic PTW, any capped areas within the PTW footprints must include reactive caps. *Id.* Moreover, any dredge areas within those PTW footprints where PTW remains at depth must include a reactive residual layer. In the FS, EPA defines an active residual layer as a 12-inch layer of sand mix with 5% activated carbon. A reactive cap includes a 12-inch chemical isolation layer comprised of sand mixed with 5% activated carbon. The prescriptive treatment technology assignments for PTW areas presented in the FS and Proposed Plan are extremely expensive. However, EPA does not provide any analysis to support a conclusion that these additional remedial action components will reduce any risks at the Site, nor does EPA provide any assessment of practicability for this requirement. Large areas of the Site, approximately 172 acres in total, are classified in the Proposed Plan as PTW areas. For EPA's selected remedial Alternative I, this PTW designation together with EPA's technology assignment flowcharts would require approximately 64 acres of reactive cap and approximately 46 acres of reactive layer over dredged areas. Given the substantial additional work at issue, EPA – at a minimum – should revise the Proposed Plan to include an evaluation of at least one of the remedial alternatives with and without treatment of PTW. This evaluation should assess, among other things, the extent to which this requirement will reduce the risks it is intended to address and the practicability of implementing this requirement Site-wide given the massive quantities of activated carbon that would be required compared to the limited available sources of supply.

Even if such treatment were justified in these areas, EPA does not explain how it determined that 5% activated carbon is necessary or appropriate, nor does it explain why it believes that this same treatment should be applied in all locations identified as highly toxic PTW areas. It is possible that EPA drew this approach to the percentage organic carbon from an assessment of "reliably contained" source material (*see* FS, Appendix D), but that assessment only considered one specific type of cap in its modeling scenario that happened to include a 12-inch active layer containing 5%

activated carbon. Many studies have evaluated caps with carbon concentrations in the 1 to 3% range with effective results. Moreover, it appears likely that a 12-inch sand layer with no activated carbon could be effective in some "highly toxic" PTW areas depending on the specific conditions. Therefore, even if some areas could be identified as "highly toxic" PTW areas, the technology assignment flowcharts for such areas should be revised to allow much greater flexibility with the specific remedy to be determined based on further study and experience during remedy implementation.

Given EPA's departure from PTW Guidance and misapplication of data from the Site's human health risk assessment, the PTW approach in the Proposed Plan and FS is inconsistent with EPA's approach at other large sediment sites. A few examples are summarized below:

- **LDW Superfund Site** – In the 2014 ROD for the LDW site, EPA Region 10 determined that contaminated sediments outside of five early action areas were not highly mobile or highly toxic. Large portions of this site outside of the early action areas have surface sediment PCB concentrations much greater than the 200 µg/kg set for PTW at Portland Harbor, with some areas exceeding 1,300 µg/kg. In the discussion of PTW in the LDW ROD, EPA Region 10 also noted that, once contaminated sediment is capped or dredged, exposure through seafood consumption would cease. As noted above, neither the Proposed Plan nor the FS for the Site address this part of the analysis. In addition, the LDW ROD allows for flexibility regarding *in situ* treatment at that site, basing the decision on pilot testing currently being conducted to evaluate the effectiveness of treatment.
- **Grasse River Superfund Site** – At this site, EPA characterized the most highly contaminated sediments as PTWs. However, the site's 2013 ROD states that EPA does not believe that treatment of the PTWs was "practicable or cost effective given the widespread nature of the sediment contamination and the high volume of sediment that would need to be addressed." The remedy for Grasse River Superfund Site targeted PCBs concentrations exceeding 1,000 µg/kg using a combination of removal and containment.
- **Gowanus Canal Superfund Site** – In the 2013 ROD for this site, PTW were identified as including only (1) NAPL; and (2) contaminated sediment that is mobile when disturbed, has elevated concentrations of toxic compounds, and presented significant risks.
- **Fox River and Green Bay Site Operable Units 1 and 2** – A 2002 ROD for this portion of the site noted that some PCB concentrations created a risk in the range of 10^{-3} or more, but concluded that "it would be impracticable to closely identify, isolate, and treat these principal threat wastes differently than the other PCB sediments." Once the remedy was implemented the source materials and PTWs would have been removed from the site and that, as a result, "the mobility of the principal threat wastes will have been greatly reduced."
- **Lower Passaic River Study Area** – In the 2016 ROD for the Lower Eight Miles of the Lower Passaic River, the most highly contaminated sediments were considered to be PTW. However, the ROD did not define what sediments were actually classified as PTW. EPA considered treatment as a component of dredged material management for the site's remedial action, but concluded that it did "not believe that additional treatment of all the sediment in the lower 8.3 miles is practicable or cost effective, given the high volume of sediment, the number of COCs that would need to be

addressed, and the lack of applicable treatment technologies." According to the ROD, dredging or capping was used to address PTW within this portion of site. Similar to the LDW ROD, the Lower Passaic River ROD included provisions allowing flexibility regarding the use of *in situ* treatment, noting that a reactive cap may be used in some areas of the site if EPA identified appropriate technology during the remedial design.

The Proposed Plan and FS must be revised to correct these errors and omissions. Moreover, since the information in the current Proposed Plan and FS so badly misrepresents the results of the human health risk assessment for the Site, EPA should revise the Proposed Plan to include an explanation of its errors and the basis for its new analysis to ensure that the public understands that conditions as described in Figure 7 of the Proposed Plan do not accurately reflect the true condition of the Site.

Section Conclusions:

- EPA's flawed approach to PTW in the Proposed Plan and FS are responsible, at least in part, for EPA's decision to reject certain remedial alternatives.
- Once the Proposed Plan and FS are revised to incorporate the appropriate PTW approach, the remedial alternatives must be re-assessed based on the new PTW assessment.
- Neither the Proposed Plan nor the FS includes sufficient information or analysis to support the technology assignments based on the "highly toxic" PTW designation. For example, EPA does not provide any analysis to support a conclusion that the additional remedial action components required for such areas will reduce any risks at the Site, nor does EPA provide any assessment of practicability for those requirements.

V. THE PROPOSED PLAN AND FS SHOULD BE REVISED TO INCLUDE A MORE ACCURATE AND COMPLETE DESCRIPTION OF THE REMEDY'S IMPACTS ON THE COMMUNITY

In selecting a remedy under CERCLA, EPA is required to assess future costs and other impacts on the community and to present that information to the public in the Proposed Plan. *See* 40 C.F.R., Section 300.430(f). These assessments are necessary not only for EPA's comparison of remedial alternatives and to support its selected alternative, but also to provide the public with the information it needs to knowledgably comment and participate in the remedy selection process. *Id.* Unfortunately, EPA's analysis and presentation of costs and other impacts is flawed. In the Proposed Plan and FS, EPA grossly underestimates the time required to complete each remedial alternative, underestimates costs and fails to describe accurately the other burdens to be borne by the community such as increased truck traffic, traffic interruptions, impaired use of properties, and noise and light disturbances. In overstating the benefits to be realized from its selected remedial Alternative I and understating the costs and impacts of remedial work generally, EPA has skewed the analysis and presented a distorted plan for the public to comment on. The Proposed Plan and FS must be revised to present more accurate and complete information regarding costs and other impacts as discussed below.

A. EPA Underestimates the Durations of the Remedial Alternatives

In the Proposed Plan and FS, EPA assumes that dredging for the remedial alternatives will occur 24 hours a day, 6 days a week from July 1 through October 31 (based on the Willamette River's allowable in-water fish work window). These assumptions regarding dredging productivity are unrealistic on remedial projects of this scale and duration. In the 2015 Draft FS, EPA acknowledged that these assumptions may not be possible given community impacts, stating: "[t]he daily and weekly durations of removal operations may be refined if community 'quality of life' concerns (such as night-time noise or light pollution) are identified." 2015 Draft FS, Section 3.3.4.1. However, various other factors will almost certainly impact dredging productivity over the life of this project, including unanticipated construction delays due to such factors as weather conditions and equipment repairs, additional time required to implement engineering such as installation and removal of sheet pile walls and silt curtains for dredging, and periodic slowdowns or interruptions due to such factors as bottlenecks at the transload facility or in the dredge return water processing system. The schedule estimates underlying EPA's projected duration for each remedial alternative should be revised to address these issues.

The unrealistic dredging productivity assumptions in the Proposed Plan and FS can be illustrated by comparing those assumptions to actual experience of dredging productivity for the Boeing Plant 2 early action project on the LDW site, which EPA has cited in support of its assumptions at Portland Harbor. For the final two dredging seasons at the Boeing Plant 2 site, dredging operations were approved to occur 20 hours a day, 6 days a week. To meet this dredging schedule, Boeing was required to obtain approval for a noise variance to conduct work outside of normal accepted construction hours (7 am to 7 pm) due to the close proximity of residential neighborhoods. This aggressive schedule was accepted by the community with the understanding that it would reduce the number of dredging seasons required at this site. However, noise complaints were still received from neighbors during construction. Despite this approved dredging operation schedule, Boeing was generally only able to meet this schedule 75% of the time. The primary factors that resulted in lower production for this project were transload facility production rates, railcar availability for disposal transport, and down time required for the dredge water processing treatment system. As noted above, it does not appear that EPA has taken any of these factors into account in estimating work duration at Portland Harbor.

EPA's unrealistic assumptions regarding duration skew the assessment of remedial alternatives by reducing the period of time required to complete the alternatives. While EPA has underestimated the time required to implement each alternative, the impact of this distortion is most significant for the more intensive remedies that rely more on dredging (Alternatives E-I). This presentation is also misleading for the public, setting unrealistic expectations of the duration of the construction project and related impacts and disruptions to the community as discussed below.

Section Conclusions:

- In the Proposed Plan and FS, EPA understates the period of time that will be required to construct each remedial alternative. For example, EPA assumes that dredging for the remedial alternatives will occur 24 hours a day, 6 days a week from July 1 through October 31. This assumption is not realistic.
- The dredging rates assumed in the Proposed Plan and FS were not achieved even at the Boeing Plant 2 early action project on the LDW site cited by EPA in support of its duration estimates. For the final two dredging seasons at the Boeing Plant 2 site,

dredging operations were approved to occur 20 hours a day, 6 days a week, which required a noise variance. Even then, Boeing was generally only able to meet this schedule 75% of the time.

- In understating the time required to complete the remediation, EPA has set unrealistic expectations for the public that cannot be met.
- In understating the time required for dredging, EPA has also skewed the comparison of remedial alternatives since the impact of this understatement is most significant for the longer-term remedies that rely more on dredging (Alternatives E-I).

B. Gross Underestimation of Remedial Action Costs

Accurate cost estimates are necessary for any remedy selection under CERCLA. As noted above, one of the core functions of an FS is to weigh the respective costs and benefits of remedial alternatives, and the Proposed Plan must present that information to the public in an understandable format. However, the cost estimates presented in the Proposed Plan and FS are inaccurate, grossly understating future costs. This underestimation of costs is due to factors including the following:

- The discount rate used by EPA is far too high
- EPA's overly-optimistic assumptions regarding construction durations also result in an underestimation of costs
- EPA's estimates exclude longer-term costs
- The contingency rate used by EPA is too low
- Additional information is required to evaluate certain categories of costs

When these and other factors are considered, the cost estimates will increase for each remedial alternative, especially the more intensive alternatives expected to be longer in duration such as Alternatives E-I. Even with more complete and accurate information, it is still possible that actual costs will be significantly higher. See Carscadden, Reid, Ben Starr, and Barry Kellems (Carscadden et. al). 2015. The Real Cost of Sediment Remediation: An Examination of Critical Cost Factors to Consider during Feasibility Planning. In: Remediation and Management of Contaminated Sediments. Eighth International Conference on Remediation and Management of Contaminated Sediments (New Orleans, LA; Jan 12–15, 2015) (documenting the history of FS and ROD cost estimates at sediment sites underestimating remedial costs, with actual costs shown to be 1.5 to 5 times higher than the ROD estimates). Given the significant costs at issue here, it is critical that EPA address the following defects in its cost estimates.

1. The Discount Rate Used by EPA is Far Too High

In the FS and Proposed Plan, EPA prepared present value cost estimates for the remedial alternatives prepared using a 7% discount rate. This rate is based on EPA's 2000 guidance document titled *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study*. However, this rate is outdated, unrealistic, and not an appropriate representation of current economic conditions, where low interest rates prevail. Given current prevailing rates, EPA cannot apply a 7% rate in reliance on guidance since that decision would violate EPA's mandate under federal regulations requiring an accurate assessment of costs. Moreover, the 2000 guidance

document relied on by EPA does not require it to apply a 7% rate where, as here, EPA can provide an explanation supporting the use of a different rate.

The Proposed Plan and FS cost estimates should be revised to incorporate a new discount rate based on an updated version of the original Appendix C of the Office of Management and Budget (OMB) Circular A-94, which was cited as the source of the 7% discount rate in EPA's 2000 guidance. The OMB Circular notes that the 7% discount rate "approximates the marginal pretax rate of return on an average investment in the private sector in recent years." Memorandum: Revisions to OMB Circular A-94 on Guidelines and Discount Rates for Benefit-Cost Analysis. OSWER Directive No. 9355.3-20. (USEPA 1993). However, it also notes that "[s]ignificant changes in this rate will be reflected in future updates of this Circular." *Id.* These updated rates are provided annually in Appendix C to OMB Circular A-94. Currently, the updated 30-year project real discount rate in the OMB-Circular A-94 Appendix C for Year 2016 is set at 1.5%. *See* 2016 Discount Rates for OMB Circular No. A-94, Executive Office of the President, Office of Management and Budget (February 12, 2016).

Given current prevailing rates, EPA has already used rates far below 7% at many other sites across the country, including sites within EPA Region 10. For example, the discount rate applied to the remedial alternatives in the Feasibility Study for the LDW site approved by EPA Region 10 was 2.3%, based on OMB Circular A-94 Appendix C for Year 2011 for a 30-year project. *See* Final Feasibility Study, Lower Duwamish Waterway Group (October 31, 2012), Appendix I. This same discount rate of 2.3% was also applied to the remedial alternatives by the LWG in their 2012 Draft FS for the Site.

As noted in the EPA 2000 guidance document, "the choice of a discount rate is important because the selected rate directly impacts the present value of a cost estimate, which is then used in making a remedy selection decision." The use of the 7% discount rate rather than a lower rate, has the effect of substantially underestimating the present value of future costs of the remedial alternatives. This underestimation is particularly pronounced for remedies of a longer duration. For example, assuming a 30-year uniform cash flow, using a realistic discount rate of 1.5% results in an estimated present value cost of more than *4 times* the present value cost estimated using EPA's 7% discount rate.

Section Conclusions:

- The discount rate of 7% that EPA used for its cost estimates in the Proposed Plan and FS should be corrected and the cost estimates should be recalculated using a reasonable and up-to-date discount rate
- The 7% discount rate suggested in 2000 guidance does not preclude EPA from using a more reasonable, up-to-date discount rate in the Proposed Plan or FS, nor does it relieve EPA of its duty under federal regulations to develop an accurate cost estimate
- EPA's use of a 7% discount rate results in EPA underestimating the costs that will be required to implement each of the remedial alternatives but skews the cost estimates more for the more intensive remedies (Alternatives E-I) that are projected to take longer
- EPA should set the discount rate for the cost estimates in the Proposed Plan and FS using the updated 30-year project real discount rate in the OMB-Circular A-94 Appendix C, which is 1.5% for 2016.

2. EPA Ignores Long-Term Costs

For the cost estimates presented in the Proposed Plan and FS, EPA chose to ignore any costs to be incurred beyond a thirty-year period, stating that "the increase of present value cost due to small periodic expenditures for maintenance and monitoring after 30 years is minimal relative to the accuracy range of the estimates." FS, Appendix G. However, *none* of the remedial alternatives will be complete in thirty years because monitoring and operation and maintenance (O&M) costs, as well as other periodic costs, are likely to continue for a much longer period. The FS acknowledges that fact, stating "the project duration for each alternative is longer than the period of evaluation," but "that evaluation of long durations of O&M is cumbersome and is generally not necessary for comparative evaluation between alternatives..." Id.

The Proposed Plan and FS should be revised to include cost estimates that include components for long-term costs beyond year thirty. While the difference is not dramatic (as noted by EPA) when the 7% discount rate is applied, these costs excluded from EPA's estimates are material when a more reasonable discount rate is used. For illustrative purposes, if these additional costs are estimated for the 100-year scenario cost comparison included in the sensitivity analysis at Appendix N of the FS, the additional 70 years of monitoring, O&M, and other periodic costs adds another \$741 million (in non-discounted dollars). The cost for this additional 70 years is approximately the same as the total capital costs needed to construct this remedial action. Furthermore, the effect of using inappropriately high discount factor is exaggerated with 100-year scenario with the estimated cost for a 100-year cash flow being almost *140 times greater* when using an appropriate lower discount rate.

Section Conclusions:

- EPA should recalculate the cost estimates to include anticipated costs beyond year 30.
- Such costs beyond year 30 will make a meaningful difference to the cost estimates once a more reasonable discount rate is applied.

3. EPA's Underestimation of the Project Duration Also Results in Underestimated Costs

As described above, EPA's estimates for the time required to complete construction of the proposed remedial action are not reasonable and should be revised. When the schedule projections are revised, the cost estimates will increase. Even if the work to be performed does not change, the capital costs will increase due to longer period for equipment rental, extended periods of employment, longer project management, additional mobilizations and demobilizations, extended transload property lease and rental periods, and various other factors that will be influenced by the duration of the project. While the sensitivity analysis at Appendix N of the FS examines changes in the construction duration by $\pm 50\%$, the methodology holds the total capital construction costs as constant and just spreads these costs out over time differently. As a result, EPA projects that costs will decrease if the project takes longer than expected. This approach is entirely unrealistic.

Section Conclusions:

- Once EPA corrects the durations, it also should revise its cost estimates to include additional costs that will be incurred due to longer construction periods.

- Cost components that may be more expensive due to longer construction periods include the cost of equipment rentals, extended periods of employment, longer terms for project management, additional mobilizations and demobilizations, and extended transload property lease and rental periods.

4. EPA Fails to Adequately Assess the Availability and Cost of Suitable Capping Material

EPA's selected remedy will require a large volume of sand for use in capping and for covering dredge residuals during construction. For Alternative I, an estimated 676,000 cubic yards of sand will be needed. Potential sources may include sand from the Columbia River, which has been used for prior capping projects within the Site. However, it is unclear if sand from the Columbia River will meet the very stringent PRGs that EPA has set in the Proposed Plan. Analytical testing of 23 samples of Columbia River sand from within the navigation channel was conducted in 2008 by the United States Army Corp of Engineers. See United States Army Corp of Engineers, Portland District (USACE). 2009. Columbia River Mainstem Federal Navigation Channel Sediment Quality Evaluation Report. September. The results indicated that two locations in the channel had concentrations of PCBs of 69 and 133 µg/kg, much greater than the Site's PRG for PCBs of 9 µg/kg. The levels of arsenic, cadmium, and mercury in a few of the samples also exceeded PRGs for these metals at the Site. It appears that EPA's extremely low PRGs that have created the need for such enormous volumes of sand for use at the Site may also slow the performance of work and increase the cost due to a lack of available sand to complete the work. Neither the Proposed Plan nor the FS address these issues.

Section Conclusions:

- Neither the Proposed Plan nor the FS adequately assess the cost or availability of capping material given the enormous volume of such material that will be required.
- Given the very low PRGs identified in the Proposed Plan and FS, it may be very difficult to find an adequate supply of capping material that meets PRGs. The Proposed Plan and FS should be revised to assess these issues.

5. EPA's Contingency Rate Is Too Low

In Section 5 of EPA's guidance titled *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study*, the recommended range for scope contingency is from 10 to 25%, while the recommended range for bid contingency is 10 to 20%. These rates are cumulative, meaning that total contingencies generally should fall in the range of 20 to 45%. Given the complexity of the Portland Harbor Site and the substantial additional remaining questions, EPA should have selected a contingency rate at or near 45%. Instead, EPA set the total contingency at 20% -- the low-end of the range. This lower contingency rate results in an underestimation of the remedial action cost estimates and skews the cost-benefit analyses in favor the more expensive remedial alternatives.

Section Conclusions:

- Under EPA guidance, the recommended range for scope and bid contingencies combined is 20% to 45%. Given the complexities of the Site, the contingency here should be set at or near 45%.

- In setting the contingency at just 20%, EPA substantially understates costs and skews the analysis toward more expensive remedial alternatives.

6. EPA Should Provide Additional Details and Backup Regarding Its Cost Estimates

Various components of the cost estimates in the FS cost appendix are not sufficiently explained or supported to allow a detailed assessment. In general, the cost worksheets in the appendix merely summarize the information, and the necessary supporting information is not provided. As a result, it is unclear if or how certain items were included in the cost estimates. For example, in the FS, EPA acknowledges that "dilapidated, obsolete, or temporary structures" are located in contaminated sediment or river banks within the Site. *See* FS, Section 3.4.3, p. 3-10. However, it assumes that all such structures are not actively being used and that they will be removed prior to construction. *Id.* While EPA does include an estimate for removal and replacement of approximately 1,700 pilings identified in FS as obstructions to the preferred remedy, it is unclear if this estimate is intended to include costs for removing all structures as required during the remedial construction. EPA also fails to account for the cost of secondary stabilization (such as toe of slope stabilization and bulkhead stabilization) of in-water structures that will remain in place during construction, which could be significant given the age and condition of many of the existing structures along the river.

Section Conclusions:

- Various components of EPA's cost estimates are not adequately explained or supported to allow for a detailed assessment.
- For example, additional information and backup documentation should be provided in the Proposed Plan or FS for structure removal and bank stabilization.

VI. CONCLUSION

SSI and MMGL appreciate the opportunity to submit these comments on the Proposed Plan and remedial alternatives evaluated in the FS. As discussed above, various revisions and additional information and analysis will be required to ensure that the Site remedy can be achieved in a cost-effective manner that minimizes unnecessary disruptions to the community. SSI and MMGL look forward to EPA's response to these critical issues.

Sincerely,



Greg A. Christianson

APPENDIX A

Comments of Schnitzer Steel Industries, Inc. and
MMGL Corp. on the Proposed Plan for the
Portland Harbor Superfund Site

September 6, 2016

Figure 10a: Technology Assignments for Navigation Channel and Future Maintenance Dredge Areas

ALTERNATIVE

